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TRANSLATIONS ON ENVIRONMENTAL QUALITY

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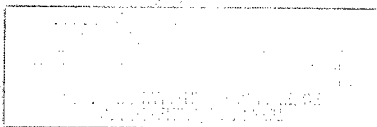
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No. 148

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# INSTRUCTION FOR OPERATION OF DUST, GAS PURIFIERS

Sofia DURZHAVEN VESTNIK in Bulgarian 5 Aug 77, pp 698-703

[Committee for Environmental Protection Instruction No 1 on the operation of dust and gas purifiers (installations)]

[Text]

## Chapter 1

### General Stipulations

Article 1. The present instruction shall apply to gas and dust purifiers (installations) whether operating, or in the process of being designed or built, further identified as gas purifiers, whose purpose is to protect the air from pollution with harmful substances.

Article 2. (1) In the sense of this instruction the gas purifiers shall be individual apparatus or groups of apparatus and respective mechanisms, instruments, and other equipment used for tapping or rendering harmless harmful components in gases and ventilation emissions released in the atmosphere.

(2) Such systems shall include the following:

1. Apparatus for the treatment of gases with an electrostatic field (dry or wet);
2. Woven and porous filters;
3. Stratified filters;
4. Dry inertial dust-trapping devices (screens, louvered dust traps, precipitation chambers, and others);
5. Wet dust catchers (scrubbers, rotary arms [rotokloni], foaming apparatus, mixers, fast turbulence apparatus, and others);
6. Systems for the chemical treatment of gases (absorption, adsorption, recuperation systems and installations for the processing of tapped products);

7. Kilns and installations for deodorizing and catalytic breakdown and residual burning of waste gases.

Article 3. The stipulations of this instruction shall not apply to gas treatment systems installed in mobile motor vehicles (automotive vehicles, locomotives, ships), or facilities with radioactive emissions.

Article 4. Industrial production facilities and technological installations considered as atmospheric pollution sources shall be classified into four groups based on the qualitative composition and harmfulness of the components released with waste gases:

1. Group 1: Industrial production facilities and other activities with air from suction installations and conventionally clean gases whose content of harmful substances does not exceed the health norms of the work environment;
2. Group 2: Industrial production facilities and other activities emitting in the atmosphere gases and suction air under the conditions of group 1 but with an unpleasant odor;
3. Group 3: Industrial production facilities and other activities which release in the atmosphere gases and suction air containing non-toxic and inert materials exceeding the health norms of the working environment;
4. Group 4: Industrial production facilities and other activities emitting gases and suction air in the atmosphere containing cancerogenic and toxic substances.

Article 5. (1) Basic industrial production facilities and technological installations which pollute the air shall be included in the groups innumrated in the preceding article as follows:

1. Ferrous metallurgy:

- a. Group 1: Boiler units and industrial furnaces (combustion systems), burning natural gas or low sulfur fuel oil;
- b. Group 3: Drying cylinders, lime kilns;
- c. Group 4: Coke batteries, coke ovens, ferroalloy furnaces, cupola furnaces, Martin furnaces, steel electric arc furnaces, converters, and agricultural conveyer belts;

2. Non-ferrous metallurgy:

- a. Group 3: Crushing and grinding sections, and transportation-reloading junctions;
- b. Group 4: Sinterin machinery, granulators, shaft, tubular, heat treatment, roasting, and reverberatory furnaces, Waelz furnaces, converters, copper concentrate dryers, and others;

3. Chemical industry:

- a. Group 1: Industrial furnaces and combustion systems operating on natural gas and low sulfur fuel oil;
- b. Group 2: Production of diluted nitric acid with catalytic removal of residual gases;
- c. Group 3: Soda regenerating boilers, and production facilities for colophon, yeasts, and ethyl alcohol;
- d. Group 4: Production of polyethylene foil, polyamide and formaldehyde resins, phthalic anhydride, nitric, sulfuric, and hydrochloric acids, dichlorothane, vinyl chloride, calcium carbide, carbamide, herbicides, ammonia, methanol, acetylene, phosphorus salts, granulation powers for ammonium nitrate, caprolactam, and soda production (carbonization columns and lime kilns), and others;

4. Petrochemistry and petroleum refining:

- a. Group 1: Industrial furnaces using gas and low sulfur fuel oil;
- b. Group 3: Production of catalytic agents;
- c. Group 4: Production of phenol, acetone, selective and contact oil refining, petroleum and petroleum product containers, production of bitumen, synthetic fatty acids, and latex dryers;

5. Production of construction materials:

- a. Group 1: Combustion systems operating on natural gas;
- b. Group 3: Clinker furnaces, cement mills, drying drums, grinding systems, and transportation and containerization of materials: Sifting installations, and installations for the extraction and processing of quarry materials, and timber processing;
- c. Group 4: Asphalt and asphalt concrete systems, shops for liming and industrial sanitation goods using polymers and formaldehyde resins;

6. Power industry:

- a. Group 1: Boilers using natural gas, naphtha, and low sulfur fuel oil;
- b. Group 3: Oilers operating on coal and high sulfur fuel oil, drying drums, ventilation systems in transfer and grinding sections, coal grating sections, and coal transportation systems.

(2) Production facilities and processes not mentioned in this article shall be classified in one of the groups by the respective department with the approval of the Committee on Environmental Protection.



(3) The stipulated groups for the various production processes shall be applicable to all enterprises and activities regardless of their departmental affiliation.

Article 6. Industrial waste gases shall be classified into organized and non-organized emissions. Organized emissions are those released into the atmosphere through a special gas pipe (stack, valve). Non-organized emissions are those whose gathering (collection) within a common collector for releasing to the atmosphere would be either impossible or inexpedient because of production conditions.

Article 7. (1) Gas filtering and dust tapping systems shall be classified into industrial and sanitary. Industrial shall be those included in the technological process and which do not release gases into the atmosphere; sanitary will be those used for the purification of gases prior to their release into the atmosphere.

(2) The stipulations based on this instruction shall apply to sanitary filtering systems.

Article 8. The organization designing the installation and structure of the individual apparatus shall be responsible for the choice of the most efficient system and apparatus for gas filtering and for the operational reliability of the selected apparatus.

Article 9. Designs for gas filtering installations must include the proper control and automation facilities as per articles 16 and 17.

Article 10. Gas filtering installations used for the purification of gases containing combustible and explosive substances shall mandatorily meet fire safety regulations.

Article 11. Plans for electric gas filtering installations must meet the stipulations of the Regulation on the Technical Operation of Electric Power Systems and the Regulation on Technical Safety in the Operation of Electric Power Systems.

Article 12. Any design of a gas filtering installation must mandatorily include:

1. A balance of the harmful substances contained in the gas and of the treatment effectiveness;
  - a. Computations on the dispersal of harmful substances and of their content in the air at the breathing level, taking also into consideration existing background pollution. The results of such estimates must be within the limits of operative health norms.

Article 13. (1) The number of gas filtering and dust tapping systems shall be determined with a view to insuring the continuing filtering of the gases

released into the atmosphere in the course of operating basic technological systems.

(2) The designing and building of bypassing lines for the release of gases directly into the atmosphere, without filtering, shall be forbidden.

Article 14. Officials employed by enterprises, design organizations, departments, and other organizations making or approving designs who violate the stipulations of this instruction shall be held liable as per article 31 of the Law on Administrative Violations and Penalties.

## Chapter 2

### Stipulations Governing the Servicing of Gas Filtering Installations

Article 15. Gas filtering installations must be mandatorily equipped with:

1. Locking armature at the gas entrance and exit with manual or remote control flanges for the installation of end-caps in testing individual apparatus under pressure;
2. Hatches and entrances for apparatus control and repairs;
3. Nozzles for the installation of safety valves, control-measuring equipment, sample taking points (in front of or behind the equipment), draining systems, and meters for determining levels in the bunkers;
4. Hatches for testing the condition (filling) of bunkers and draining systems.

Article 16. (1) Second group gas filtering and dust tapping installations with a gas capacity of 50,000 cubic meters per hour or higher, third group installations with a gas capacity in excess of 25,000 cubic meters per hour, and fourth group installations, regardless of capacity, shall be equipped with control-measuring instruments in accordance with the design.

(2) Such installations must be equipped with the following basic control-measuring instruments:

1. Differential manometers for measuring the hydraulic resistance of the apparatus;
2. Instruments for measuring by remote control the temperature at the entrance and the exit containing a signaling system which is triggered should the temperature rise above the normally admissible level or drop below the sprinkling point;
3. Wherever possible, automatic sample takers and equipment for determining the pollution of the gas at the entrance and the exit and for signaling any excess content of dust and harmful components in the filtered gas over and above the levels stipulated in the design or production instruction;

4. Level meters signaling the filling of the bunkers and draining systems;
  5. Manometers measuring the pressure of the water supplied to the wet dust separators or the gas conditioning system;
  6. Meters showing the quantity of water fed to the installation.
- (3) The reading and recording instruments shall be mounted on the control panel of the gas filtering system or the control panel for the technological process.

Article 17. (1) The gas filtering installations shall be paid for out of automation funds in accordance with the design.

(2) The basic automated control facilities for gas filtering systems shall be the following:

1. For systems with an electrostatic field and a gas load in excess of 25,000 cubic meters per hour:
  - a. Shaking of corona and precipitation electrodes and gas distribution grids;
  - b. Vibration (cleaning) of bunker walls;
  - c. Maintaining the necessary electric power system for feeding the electric filter;
2. Sleeve filters:
  - a. Filter blowing;
  - b. Maintaining the regeneration air pressure and temperature;
3. Apparatus for chemical treatment of gases:
  - a. Maintaining the steady concentration of the solution;
  - b. Maintaining the steady pressure and volume of the solution entering the apparatus;
4. Wet dust separators:
  - a. Maintaining the constant water pressure before the apparatus;
  - b. Maintaining a steady level in the apparatus.

Article 18. Apparatus and parts of gas filtering installations subjected to control as vessels operating under pressure shall be equipped with control-measuring instruments and safety systems in accordance with the stipulations of the Regulation on Technical Supervision.

Article 19. The enterprise's management must insure the maintenance of gas filtering systems in an operating condition. It must take promptly the necessary measurements and make investigations and required repairs, and organize the proper operation of all apparatus and equipment insuring the filtering of gases released in the atmosphere in accordance with the norms and requirements of the present instruction.

Article 20. The enterprise's management must:

1. Name with an order the individuals (individual) responsible for the operation of the gas filtering installations and appoint the necessary personnel for the normal servicing of such installations;
2. Test the knowledge of the servicing personnel by a qualification commission no less than once every two years; the results of the test must be entered in a separate diary;
3. Approve technical proofs for the operating and servicing of gas filtering installations located at the respective work places;
4. Insure an available minimum of charts and blueprints of the filtering installation needed for its operation;
5. Keep a log book to record work indicators and the condition of gas filtering systems.

Article 21. The technical rules should indicate the reasons and procedure for emergency stops of individual apparatus or the entire installation.

Article 22. The use of gas filtering installations with faulty assemblies and apparatus or violated technological systems, lowering the effect of the filtering, shall be considered an emergency condition as follows:

1. For all installations:
  - a. In the case of violation of normal parameters of the purified gas in terms of volume, temperature, pressure, dust content, chemical composition, humidity, physical-chemical and dispersion composition of the dust in excess of the limits stipulated in the operational instruction;
  - b. Whenever the systems for the removal of the tapped material are either inoperative and do not insure such removal under normal operation conditions of the installation;
  - c. In the case of dripping (or leaking) within the system in excess of limits stipulated in the operational instruction;
  - d. In the case of violations of the shaking, washing, or blowing systems of working elements of the apparatus (electrodes, sleeves, and others);

2. For electric filters:

- a. In the course of operations, with no pressure, or whenever 50 percent or more of the fields receive pressure below the lower limit stipulated in the instruction;
- b. In a displacement or deformation of electrode systems and a reduction of the interval between corona and precipitation electrodes below the level stipulated in the instruction;

3. For sleeve filters:

- a. Should even a single sleeve be torn or should the overall area of the pairs along the sleeves equal the area of a single sleeve;
- b. Whenever the sleeve fabric loses its filtering capacity;
- c. Whenever the temperature of the incoming gas exceeds the maximally tolerated limit as stipulated in the operational instruction for the corresponding sleeve material;

4. For installations for chemical and wet gas filtering;

- a. Whenever the installation does not receive an adequate quantity of water or solution or their equal distribution along the entire apparatus is not insured;
- b. Whenever mechanical admixtures in the water (solution) exceed the established limit (norm);
- c. In the case of plugging (pollution) of the catalytic stratum or the sorbent;
- d. When the washing and stratum (catalyzer, sorbent) system is disturbed;
- e. Whenever the concentration of solutions violates the stipulations of the operational instruction (regulation).

Article 24. Should the gas filtering systems develop an emergency condition, the individual responsible for their operation must determine the reasons and enter his notes in the log book as well as the measures needed for restoring them to a normal condition. This must be reported to the enterprise's management.

Article 25. (1) It is forbidden to operate basic technological (production) equipment with faulty gas filtering installations.

(2) Exceptionally work without operational gas filtering installations may be allowed by the Committee for Environmental Protection.

(3) In the case of emergency stops of gas filtering installations in projects of importance to the national economy the chairman of the Committee for Environmental Protection shall prescribe a work system and deadlines for the stopping of basic technological machinery.

Article 26. (1) No less than once every three months the enterprise's management must check the condition and operation of gas filtering installations following the installation of second, third, and fourth group technological equipment. A protocol shall be drawn up on the results of the investigation or an entry shall be made in the log book including the measures taken for the elimination of noted shortcomings.

(2) The following must be checked in the course of the investigation:

1. Working order of communications, heat insulations, and anti-corrosion linings;
2. Proper operation of equipment, automatic systems, and locks;
3. Consistency between the factual installation readings and the figures stipulated in the design (instruction);
4. Observance of schedules for repairs and preventive checks;
5. Availability of instructions at work places and familiarity with instructions by the servicing personnel.

Article 27. The enterprise's management must check the condition of gases released by first group technological installations no less than once every year, paying attention to signaling equipment and facilities used in checking conventional clean gases released into the atmosphere.

Article 28. The organs of the Committee on Environmental Protection shall check periodically the work of gas filtering installations as follows:

1. Gas filtering installations of air polluting first group sources, no less than once every three years;
2. Of second and third group sources, no less than once every year;
3. Of fourth group sources, no less than once every six months.

Article 29. The enterprise's management must check (determine) the effectiveness of gas filtering installations as follows:

1. Gas filtering and dust tapping installations of second and third group sources, after each basic (capital) repair, but no less than once every year;
2. Of fourth group sources, after each capital repair but no less than once every quarter.

### Chapter 3

#### Organization of the Installation, Repair, and Testing of Gas Filtering Installations

Article 30. The installation of gas filtering and dust tapping installations and equipment shall be based strictly on the design in accordance with effective construction norms and stipulations and the observance of the rules issued by the producers of the individual instruments.

Article 31. The following general stipulations shall be observed in the course of construction and installation operations:

1. As a rule, the installation of the gas filtering systems shall be entrusted to specialized organizations employing cadres trained in the building of such systems;
2. Important apparatus must be installed under the supervision of the chief installer of the manufacturer.

Article 32. The manufacturing of parts for gas filtering equipment (frames of apparatus, cyclones, bunkers, gas lines, collectors, and others) must be consistent with the requirements governing welded containers and, in the case of equipment operating under pressure, in accordance with the stipulations of the Regulation on Technical Supervision.

Article 33. Tolerances and deviations in the manufacturing of parts for gas filtering installations must meet the technical standards and conditions stipulated by the manufacturers.

Article 34. The materials used in the manufacturing of parts and equipment for gas filtering installations must meet the stipulations of higher durability with a view to insuring the reliable work of the individual assemblies and apparatus. Preventive and thermal installations in the apparatus should be manufactured by a specialized organization, observing stricter quality requirements.

Article 35. (1) Newly installed gas filtering installations shall be accepted for use by a commission appointed by the management of the enterprise or department.

(2) The following must be checked before accepting an installation as per the preceding paragraph:

1. Implementation of the entire work in accordance with the design;
2. Quality of anti-corrosion, shielding, and insulation operations;
3. Existence of control-measurement equipment and automatic facilities needed for the normal operation of the installation;

4. Records on the testing of individual assemblies and apparatus and of invisible operations.

Article 36. (1) The gas filtering installations of first group air polluting sources with a gas emission volume of 50,000 or over 50,000 cubic meters per hour, of second group sources with 10,000 cubic meters per hour, of third group sources with 5,000 cubic meters per hour, and of fourth group sources regardless of the volume of gases emitted, must be mandatorily registered at the Rayon Environmental Protection Inspectorate.

(2) The registration shall be based on a letter submitted by the enterprise accompanied by the following documents:

1. Minutes on the acceptance of the equipment and the beginning of its utilization containing data on the measurement and the effect of the installation;

2. Registration sheet (appendix).

Article 37. (1) Prior to the beginning of the testing operation and the tuning and regulating of the newly installed gas filtering installations, the project management shall inform in writing the Rayon Environmental Protection Inspectorate on the beginning and duration of the testing operational period. The purpose of the testing operational period shall be to establish the effect of the installation and its consistency with the design.

(2) The acceptance of gas filtering installations subject to registration by the Rayon Environmental Protection Inspectorate for regular use shall take place in the presence of a representative of the inspectorate.

Article 38. (1) The periods for basic (capital) and other repair categories for gas filtering equipment shall be determined by the enterprise's management in accordance with the departmental instruction on planned-preventive repairs and existing specific conditions.

(2) The planning and implementation of planned-preventive repairs of gas filtering installations shall be conducted under normal circumstances together with the industrial equipment on which they have been installed.

(3) If necessary the gas filtering equipment may be repaired separately as well.

Article 39. In the course of capital repairs measures related to the modernization of gas filtering installations shall be carried out as well with a view to upgrading the durability and effect of individual apparatus and assemblies. Within the same period the stipulations of the Rayon Environmental Protection Inspectorate requiring longer equipment idling shall be implemented.



Article 40. The use of industrial equipment and the release of non-filtered gases in the atmosphere during repairs of gas filtering equipment is forbidden. Exceptionally, such work may be allowed by the head of the respective department with the permission of the chairman of the Committee for Environmental Protection.

Article 41. Unless other stipulations and requirements concerning density tests exist, it is considered that the respective sector or apparatus has passed the test should the quantity of leaks at the end of the test not exceed 8 percent.

Article 42. The testing of idling mechanisms for the shaking and carrying of tapped dust by electric filters (following the completion of the assembly or capital repair) shall take 24 hours.

Article 43. Sleeve filters shall be tested in the following sequence:

1. Accurate position of individual sleeves;
2. Tuning of blowing automated equipment (mechanisms);
3. The work of the blow dampers;
4. The work of the signaling equipment.

Article 44. (1) The testing of the individual fields of the electric filters, following the completion of the installation or the repair, shall take place in the following sequence:

1. Each field shall be fed normal tension for 15 minutes;
  2. The "air" volt-ampere characteristics shall be recorded without and with switched-on shaking mechanisms;
  3. Gas shall be fed and the "gas" volt-ampere characteristics shall be recorded in the course of the work of the shaking mechanisms;
  4. Following the development of a normal gas system the following shall be recorded: The gas temperature at the entrance into and exit from the electric filter; the humidity of the incoming gas in percentage; the pressure (or vacuum) at the entrance and the exit in kilograms per square meters; and the tension of the individual fields in kV and the current in A and mA.
- (2) Following a 72 hour test of normal work the condition of the shaking mechanisms and the transportation of the tapped dust is checked and the dust content of the gas at the entrance and the exit is measured.

Article 45. A record is drawn-up on the test of the specific gas filtering installation.

## Chapter 4

### Rating the Effectiveness of Gas Filtering Installations

Article 46. The following indicators must be determined in order to rate the effectiveness of a given gas filtering installation:

1. The quantity of gas flowing through the installation under working conditions (pressure, temperature, and moisture), as well as under conditions considered normal (zero degrees centigrade and 760 millimeters on the mercury column) in cubic meters per hour and n cubic meters per hour;
2. Chemical composition of the gas in percent (volume);
3. Humidity (absolute) of the gas in grams per n cubic meters in terms of dry gas;
4. Dust content in the gas before and after the instrument in grams per n cubic meters;
5. Fractional tapping effectiveness (filtering);
6. General effectiveness of the installation.

Article 47. (1) The velocity of the gas is measured with a pneumometric (velocity measuring) pipe. The average gas velocity ( $V_{av}$ ) is determined on the basis of the velocity field.

(2) The volume of gas going through a given apparatus is computed on the basis of the following formula:  $Q_{op} = V_{av} \times F \times 3,600$  in which  $Q_{op}$  is the gas quantity under operational conditions in cubic meters per hour;  $V_{av}$  is the average velocity of the gas in the cross section of the gas pipe measured in meters per second;  $F$  is the cross section of the gas line in square meters.

Article 48. The gas dust content is measured at the same cross sections of the gas line as the velocity field. In subsequent measurements the dust content is measured at a specific point. The average dust level is computed on the basis of the established ratio.

Article 49. The gas moisture is measured on the basis of the psychometric method, based on the difference in the readings for dry and moist thermometer or by weight.

Article 50. (1) The content of dust and harmful components in the gases is measured according to the methods stipulated in the designs for each specific case.

(2) In the case of installed equipment whose design does not stipulate a specific method, the latter must be elaborated by the respective superior department.

Article 51. Should the organs of the Committee for Environmental Protection note violations of the present instruction, the chief of the respective Rayon Environmental Protection Inspectorate shall issue the necessary prescriptions and penalize the culprits in accordance with the Law on Administrative Violations and Penalties.

#### Additional Stipulations

1. In each specific case the deadlines for making operating gas filtering installations consistent with the stipulations of this instruction shall be issued by the chief of the respective Rayon Environmental Protection Inspectorate.

#### Concluding Stipulations

2. The present instruction is mandatory for all departments and organizations.

3. This instruction is issued on the basis of articles 6 item 7, and article 10 item 1 of the Regulation on the Functions and Tasks of the Committee for Environmental Protection (DV, No 49, 1977), as ratified with Decree No 89 of the Counsel of Ministers, dated 29 October 1976.

4. Control over the observance of this instruction shall be provided by the organs of the Committee of the Environmental Protection and, respectively, the Rayon Environmental Protection Inspectorates.

Chairman: G. Pavlov

Appendix to Article 36, paragraph 2, item 2

.....(department)

.....(enterprise)

.....(address)

Registered under No...at the Rayon Environmental Protection Inspectorate in  
.....city

(date).....1970.....

signature:

seal:

Registration Sheet for the Gas Filtering (Dust Tapping) Installation

1. Name of installation.....

2. Purpose and technical characteristics (type, number, stack elevation, diameter of exit vent, and others).....
3. Manufacturing plant and year made.....
4. Installed on .....1900.....
5. Group of gas emissions.....(as per articles 4 and 5 of the instruction)
6. Volume, composition, and parameters of incoming gas for filtering (pressure, temperature, humidity, dust in grams per n cubic meters, chemical composition in volume percentage, physical-chemical and dispersion composition of the dust).....

Remark. The data listed above may be presented in separate documents.

7. Indicators characterizing the work of the installation (the data are entered in the separate lines as stipulated in the design and on the basis of the measurements in the tuning and launching of new systems or according to the last record of stalled systems).

Production Facility (Technological Line) source of air pollution	Gas load in thousand $\text{nm}^3/\text{hour}$	Content of dust and harmful gas components in $\text{gr}/\text{nm}^3$		Efficiency in %
		in	out	
1	2	3	4	5

Remark: Should the gas contain more than one harmful component data for each one of them are entered in items three and four in separate lines, showing the figure as designed and the factual measurement figure.

8. List of drawings and charts applied to the document (kept by the enterprise):

a.....  
b.....  
c.....  
d.....  
e.....

Remark. This registration sheet and the documents as per article 36 must be submitted to the Rayon inspectorate.

9. The enterprise shall keep in separate files documents for each installation as per article 36 and the drawings as per the preceding item and all minutes of tests (analyses) of individual apparatus and of the installation as a whole.

Deputy director: .....

Official in charge of operating the installation.....

.....City and date.

5003

CSO: 5000

ENVIRONMENTAL PROTECTION PROBLEMS DISCUSSED

Prague HOSPODARSKE NOVINY in Slovak 22 Jul 77 p 6

[Interview of Eng Viktor Roth, director of Slovnaft; Eng Frantisek Huba, deputy director for production; Eng Ivan Kopernicky, deputy director for technology; Eng Vlastimil Kabes, manager of the department for technological development and chairman of the CZV [expansion unknown] technological-economic committee of the Communist Party of Slovakia; Eng Ivan Ciz, manager of the department for environmental protection; and Eng Dr V. Pelikan, employee of Geotest in Brno, by Adela Skultetyova: "A Comprehensive Solution--The Only Change: On the Problems of Environmental Protection at Slovnaft"]

[Text] Our chemical industry plays a special role in the implementation of the continuous development and high efficiency of our social production. It was very precisely articulated by the discussions at the 15th CPCZ Congress. The Directives for Economic and Social Development of the CSSR in 1976-1980 stipulated: "The production in the chemical, rubber, and pulp and paper industry will be increased before 1980 by 36-39 percent. Thereby, the starting point will be the fact that the main base of raw materials will be Soviet crude oil and domestic wood material. In 1980, 20-21 million tons of crude oil will be processed basically in distilling capacities which are already existing or under construction." In addition, the development of the petrochemical production will necessarily reduce our dependence on the import of petrochemical products indispensable for the production of plastics. In the decision of the Congress, however, yet another important social need has been emphasized, namely, environmental protection. "Problems of environmental rehabilitation must be solved in particular in those places where magnesite and chemical industries are concentrated."

Thus, production must be developed and, at the same time, the environment must be protected. But how does it look in reality? We went to seek answers to those questions at the Slovnaft national enterprise in Bratislava, to which references are frequently made whenever not only Bratislava's environment but also preservation of pure underground and surface waters in the southern part of Slovakia are mentioned. Our questions were answered by:

Eng Viktor Roth, director of the enterprise,

Eng Frantisek Hubam deputy director for production,

Eng Ivan Kopernicky, deputy director for technology,

Eng Vlastimil Kabes, manager of the department for technological development and chairman of the technological-economic committee of the CZV of the Communist Party of Slovakia,

Eng Ivan Ciz, manager of the department for environmental protection,

and Eng Dr. V. Pelikan, employee of Geotest in Brno.

[Question] Whenever air pollution is mentioned in Bratislava, Slovnaft is the first to be mentioned. Is that justified? If so, what is the cause of that situation and how do you intend to improve it?

[Eng V. Roth] In agreement with the decisions of the highest party and state organs concerning the development of crude oil processing and the petrochemical industry, our enterprise has advanced considerably in recent years, especially by constructing and putting into operation the petrochemical complex of the Slovak Socialist Republic. As all over the world, such developments also cause greater pollution of the environment in our country and thus, also of the air. The main cause of air pollution is sulfur dioxide emitted from the processing tube furnaces and from the enterprises' power plant engineering, where heavy heating oil with the sulfur content is used as fuel. Less important sources of pollution are emitted hydrocarbons.

It is an objective truth that we are emitting large amounts of sulfur dioxide into the air; however, thanks to favorable wind currents only a smaller part of them reaches the area of the city of Bratislava. Nevertheless, that does not diminish our duty to solve the problems of gases produced by our enterprise promptly and comprehensively.

The present unfavorable condition stems from several facts. In particular, it is an outcome of inadequate knowledge of environmental protection problems in past years when our enterprise was being built, and then also our investment and technological potential. Our enterprise is still using sulfurized heavy heating oil as technological fuel and also as fuel for its power center. In order to solve this situation, we have prepared a specific program of measures by whose implementation we shall reduce the production of emissions by 37 percent before 1985. This involves a technologically demanding and frequently extremely costly work.

[Question] Our readers will be certainly interested in specific data concerning the type and amount of gases emitted from the plants in your enterprise. State them and compare the amount of contamination of our city with the situation of similar cities in other countries.

[Eng I. Ciz] Most of the exhaled gases are leaking particularly during the heating operations in technological furnaces, in the power engineering plant of our enterprise and from the combustion of residual amounts of hydrogen sulfide in our flare stacks. The range of gases emitted during heating operations themselves is relatively wide. It consists of carbon monoxide, nitrogen oxides, non-combusted hydrocarbons visible as chimney smoke and particularly sulfur dioxide, which is frequently used as an indicator of air pollution and whose amounts approximately indicate also the corresponding amounts of other emitted gases mentioned.

In 1972 the World Health Organization set emission standards (i.e., gradients of emitted gases) for determination of pollution of cities. According to those standards cities have been classified as clean if the average concentration of sulfur dioxide in the air does not exceed the value of  $0.06 \text{ mg m}^{-3}$ . In Bratislava a corresponding value of  $0.061 \text{ mg m}^{-3}$  was measured in 1975, i.e., close to the upper limit of the prescribed emission standard. For comparison, the following values were measured in 1970 in some of the cities of the world:

Paris	$0.11 \text{ mg m}^{-3}$
London	$0.13 \text{ mg m}^{-3}$
New York	$0.23 \text{ mg m}^{-3}$
Tokyo	$0.22 \text{ mg m}^{-3}$

We may characterize the development in recent years as positive. In comparison with 1973, we reduced the emission of sulfur dioxide by 4,000 tons annually.

[Question] How would you characterize the strategy of your enterprise for the solution of the problems of environmental protection and action? How do you plan to solve the following contradiction: environment must be protected, yet efficient development of production must also be ensured, because without it our economic development is unthinkable.

[Eng I. Kopernicky] We have prepared a program for environmental protection and action which is the result of several years of work by experts in our enterprise as well as by organizations outside of our enterprise, by scientific and research centers and professional and control organs. It is based on a very serious and reliable analysis of the current situation; it proceeds from a knowledge of the problems and from a realistic estimate of the possibilities for its implementation. I wish to emphasize that we do not consider the solution of environmental problems as a one-shot affair, but as a continuous, long-term and pertinacious process in which new paths to a lasting improvement of the environment are being sought constantly and in agreement with the intensification of our level of knowledge and scientific and technological development.



Our approach to environmental protection must be characterized as a solution of vital problems planned already during the process of determining the prognoses and concepts for the development of the enterprise in the preparatory material for the projects to be constructed. Its criteria are included in appropriate directives and norms and on their basis we are applying from the very beginning the principle that in its technological solution and structural system any kind of construction must respect the solution for the elimination of its own harmful substances, while as a unit it also must demonstrably help reduce harmful substances in the connected production units and in other installations of the enterprise.

Another factor in our strategy is the comprehensive approach to environmental protection. We have adopted a program containing provisions of a long-term investment character as well as provisions with minimum investment outlays, or provisions whose fulfillment is within the range of individual operations and workers in production.

Finally, I regard mass political work as a relevant component of our strategy; in that process the entire collective in the enterprise becomes aware that the problem of environmental protection must become a self-evident and indivisible part of our daily work and that the approach to the solution of environmental problems should be active, enterprising, creative and constructive on the widest possible base. Mass political organizations led by the party organization are helping us there.

How to solve the contradiction? How to develop production and protect the environment? This concerns a complex, world-wide problem which is a subject of consideration for almost each one of us. In my opinion, we must fully respect both the needs of the development of socialist society --efficient national economic development, its economy in covering the needs of the working people's rising living standard--and a strict concern for the protection and creation of a healthy environment.

[Question] How is environmental protection projected in the plans of the enterprise's investment development and what specific measures do you intend to implement during the next period?

[Eng I. Ciz] In their technical-technological solution and in their structural system all buildings now under construction fully respect the requirements of environmental protection. From a narrower view of exclusively ecological construction in the Sixth Five-Year Plan I should like to mention that one-third of all investment funds has been earmarked for reinvestment in our enterprise during this Five-Year Plan.

In addition to lesser constructions I want to mention in particular those which are decisively solving environmental protection. They are:

Production units for "desulfurization of gases II" and "production of sulfur according to Clauss method" which will be completed in 1979. This arrangement will enable us to process practically the entire amount of hydrogen and sulfide produced during the process of hydrogenation and now burned mostly in flare stacks for sulfur dioxide. In addition to its direct effect within the Slovnaft National Enterprise, the consumers of motor oil also will benefit, because we shall be able to reduce the sulfur content from the current maximum of 0.5 percent to a maximum of 0.2 percent of sulfur.

An automatic filler for light petroleum products into railroad containers to be completed in 1979 will make it possible for us to eliminate a substantial part of the crude oil substances escaping into underground waters and thus to eliminate the primary source of pollution.

De-oiling apparatuses for cooling and for rain water which will be completed in 1980 will enable us to reduce considerably pollutants escaping into the waters of the Maly Dunaj river.

A mechanical-chemical-biological cleaning plant for chemical waste waters to be completed in 1983 will enable us to reduce by 92 percent the pollutants escaping now into the Danube.

We are planning additional measures to improve our environment and nature prior to 1990.

[Question] What operational arrangement will you implement during the next period and how do you apply the workers' initiative, for instance of the KRB [complex rationalization brigade] in the solution of urgent problems of environmental protection?

[Eng F. Huba] In the interest of environmental protection the production sector of our enterprise will concentrate in the next period particularly on prompt implementation of political-organizational measures of a non-investment character. The most important of them are the following: regular training and realistic, vivid campaigns. We want to accomplish conscious discipline in every worker when manipulating hydrocarbon materials; we want to adopt criteria of socialist competition and incite the working people's initiative for environmental protection, to reevaluate the conditions of material interest and to organize continuous efficient controls in every sector. Among the technical-organizational measures we are introducing on a priority basis the burning of low-sulfur fuels from our own resources on the territory of our enterprise, which will reduce the  $\text{SO}_2$  emission. By constant burning of excess gases in technological furnaces we shall reduce their release in flare stacks. In order to purify waste waters, particularly cooling waters released into the Maly Donaj river, we shall switch waste water from thermal cracking [Krak] over to chemical waste water. We have already completed

a review of waste [slopove] management in the entire enterprise and now we are removing the defects which have been detected.

Also, we are checking sewer systems and marking sewer sumps for the cooling of waste waters and in case of leakage in the cooling apparatus we can immediately identify the polluting spots and promptly repair the leakage. In order to reduce the pollution of underground waters, we are rebuilding the filling installations for loading fuels into railroad containers as well as the pumping equipment for railroad containers. For releasing waste materials from railroad containers we are introducing new products which will reduce the drainage to a minimum.

All these operations are of a non-investment character; we may introduce them in the framework of general maintenance and remodeling of the equipment. When introducing these measures, we are relying fully on the workers' initiative. A concrete demonstration of that, for example, is the formation of comprehensive rationalization work team No 40. Its purpose is to prepare and implement measures for environmental protection in the sector of the refinery plant.

[Question] A particular problem area in your enterprise is protection of water--underground water as well as water of the Maly Dunaj. What are you doing for its solution? With whom are you cooperating in that area?

[Eng I. Kopernicky] In the Sixth Five-Year Plan, which we call the Five-Year Plan of ecological construction, a considerable part of our investment program is devoted to water protection. We are aware that the purity of our waters affects the possibility of agricultural irrigation of Zitny Ostrov, for which water is pumped from the Maly Dunaj River. Also, the sources of drinking water in that very important hydro-economic area must be preserved.

We are solving those problems in various ways; however, in principle we are eliminating the already known primary sources of pollution of underground waters by improving antiquated, worn out and economically obsolete installations; we are limiting the consumption of primary cooling water by passing it to circulatory cooling systems combined with air cooling; we are building sewage treatment plants for waste (cooling, chemical) water equal to the best in the world and in cooperation with the Geotest National Enterprise in Brno, we are introducing hydraulic protection of underground waters.

[Question] The work connected with the protection of underground waters has already gained the reputation of being unique. What is its essence and what are its objectives?

[Eng Dr V. Pelikan] A hydraulic screen is the main factor in the protection of underground waters against crude-oil substances from the Slovnaft National Enterprise. The hydraulic screen was selected from among many other potential solutions because it prevents the pollutants from spreading and simultaneously also gradually eliminates already existing pollution. The hydraulic screen consists of two rows of wells (22 pumping wells) through which the water passes and then is pumped away in such amounts so as to lower continuously the level of the underground water intersecting the tract of pollution from the Slovnaft. Crude-oil substances on the surface of the water as well as the polluted underground water flow into the space left by the lowered level. In order to prevent the crude-oil substances from mixing with water and from producing an emulsion which would be very difficult to remove, pumps are placed in pumping wells for automatically pumping crude-oil substances and water. The recovered crude-oil substances are returned to the production process in Slovnaft, and for the time being the water is being released into the Maly Dunaj river. In the future, after the construction of hydraulic screen is completed, the pumped water will be utilized by Slovnaft for technological purposes.

[Question] How is concern reflected by the enterprise organization of the Communist Party of Slovakia, particularly of the CZV of the Communist Party of Slovakia, concerning a thorough solution of the problems of protection and creation of the environment?

[Eng V. Kabes] In this connection our party organization also proceeds from the deliberations of the 15th CPCZ Congress which created sufficient area for operational, managing and conceptual activity and which simultaneously articulated the ways by which environmental protection must be observed during further intensification and industrialization and with further building of a developed socialist society. The main principles for the work of environmental protection are anchored in the Program of the Slovnaft National Enterprise. That program contains 16 specific vital measures whose implementation is regularly controlled by the CZV of the Communist Party of Slovakia.

In its activity the CZV of the Communist Party of Slovakia leans on the broad base of the communist members in our enterprise and directs their initiative toward systematic improvement of the environment in which we are living and working also by proper daily activity in our places of work and by short-term actions which do not require any extensive investments. For example, our membership meetings in April and December of 1976 dealt almost exclusively with environmental problems. Thus, the problems of environmental protection have gradually become a concern not only of a narrow circle of economists but also a matter of continuous interest of all of our working people.

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CZECHOSLOVAKIA

SSR DEPUTY PREMIER DISCUSSES ANTI-POLLUTION MEASURES

Prague TVORBA in Czech No 30, 27 Jul 77 pp 4, 5

[Interview with Julius Hanus, SSR deputy premier, by Marcela Zabojsnikova:  
"Vital Interests: Air and Water"]

[Text] [Question] It is stated in one of the OSN [Organization of the United Nations] documents that millions of people are in danger of dying of the consequences of industrial fallout and exhaust from motor vehicles as long as industrialization proceeds at the present pace. Does this pessimistic forecast apply also to our country?

[Answer] Warnings contained in the United Nations documents are based on the threatening conclusions of the analyses of the trend in environment in industrially developed and very urbanized areas of capitalist states. The pollution of natural components of the environment, particularly of air and waters, has indeed reached such a stage in many metropolitan centers that the very existence of man, fauna and flora is threatened.

In the socialist society, the environment and its protection have therefore become an integral part of political, economic, social and cultural development. They are a distinct component of the increase in the population's standard of living. We are commanded to do so, also, by the fundamental principles of our ideology. In his "Dialectics of Nature" Engels states that by his intervention man forces nature to serve his purposes, he controls it. We do not control it, however, in the same way--Engels states further--as the conqueror controls a foreign nation, like someone who is outside nature: we are part of it by our body, blood and brains, we are in the middle of it. Our supreme control over it lies in the fact that we enjoy priority, in relation to all other creatures, to study nature, to learn its laws and to make correct use of them.

The problem of the environment is a worldwide problem. In various forms and in varying degree it concerns all nations on the globe. Frequently, it does not originate in one's own country, but it is caused by activities in the neighboring states. For this reason, the socialist states put it

on the United Nations agenda already in 1966. As a result of this, the UN European Economic Commission organized the first conference on the environment in socialist Czechoslovakia. At the initiative of the socialist countries, the problems of the environment were also put on the agenda of the Conference on European Security and Cooperation. We can say that interest in this question is not accidental, but absolutely logical. The solution of these problems is the vital necessity of developed society which, fortunately, the whole world is beginning to realize gradually.

[Question] We are one of the few states in the world in which the protection of nature and the environment is provided for directly in the Constitution. The 15th CPCZ Congress also emphasized that it was imperative to pay increasing attention to this problem. How are these resolutions implemented by the organs of state administration and by the economic organs? Where, in your opinion, are there still unused reserves?

[Answer] The CSSR Constitution, indeed, contains provisions on the protection of the environment. The details have been spelled out in laws on people's health and sanitary living conditions, in the laws on water, on air protection, on soil, on forest, on territorial planning, in the building law, in the law on protection of nature and other regulations. Our laws are essentially very progressive and constitute a good legal basis for the protection and improvement of living environment. Those which no longer adequately reflect the contemporary and, above all, future requirements the protection of the environment will be amended or revised.

The organizational prerequisites are also created for more comprehensive control of the protection of the environment. The CSSR government appointed a Commission for the Environment, councils for the environment were established in the CSR and SSR governments, and commissions for the environment were set up in the kraj, okres and district national committees. In particular, the okres national committees in cooperation with the local national committees have sponsored several programs which aim at the improvement of the environment: the planting of trees and shrubs, maintenance, neatness, order in towns and villages. In the contest, "30 Million Trees for the Republic," 54 million trees were planted in Slovakia within 2 years. Towns, villages, farmsteads and courtyards of industrial plants turned green, wasteland was forestated. The tasks ensuing from the 14th CPCZ Congress also were incorporated in specific measures by all organs which are responsible for the environment and its protection. These measures are implemented with the thoroughness which corresponds to the seriousness of the problem. At the same time, measures are being planned which will update the implementation of the already approved long-term concept of the protection of the environment up to 1990, and the first drafts of projects are being selected which will be carried out during the Seventh Five-Year Plan.

You asked about the reserves. Well, despite already achieved improvements, there are still considerable reserves, particularly in the production sphere.

Leading economic workers must exert greater effort to improve technological discipline, to insure systematic maintenance and troublefree operation of production equipment in order to prevent significant escape of harmful substances. The enlightenment process--education, instruction and propaganda on the environment and its protection--also has still not sufficiently penetrated the consciousness of all inhabitants. Scientific and research findings on the environment are practically applied only very slowly. Even this incomplete list makes it clear that there still are enough reserves and that the only thing we must do is to "reach for" them. Naturally, all these problems cannot be solved within 1 or 2 years. The main thing is this: everybody who is responsible for the preparation and implementation of measures designed to protect the environment must regard this task as his foremost duty and put it on the same level as other tasks which our society assigned to him.

[Question] In practice we frequently encounter two extremes: on the one hand, there is a group of experts who, when engaged in a construction project, do not look right or left and ignore the problems of the environment. On the other hand, there are stubborn defenders of virgin nature who do not take into consideration the fact that a developed society, even with the best will in the world, cannot preserve the nature's original character. How do you solve the conflicts between these two, one could say opposing parties?

[Answer] The present civilization level has indeed eliminated the possibility of working with such categories as virgin nature. It is important, however, to adjust the values produced on the basis of contemporary progress in science and technology to new conditions and a desirable quality for nature--sound, balanced nature which is harmoniously fitting into contemporary civilization. We must always try to achieve this harmony everywhere in order to avoid both unrealistic extremes. So long as we possess a sense of reality, we can find a balanced and the best possible solution. Let me give you a few examples:

When the plan was announced for the construction of a pumped-storage power plant on the Cerny Vah River in the bosom of the beautiful Slovak countryside, voices expressing scepticism were heard as to whether such a project could be carried out at all. Yet, we needed the planned power source on this particular spot very urgently. We therefore prepared a project which is cautiously balanced and meets both requirements: it will satisfy society's needs and complies with the conditions for the protection of the environment. I can mention another example from the East Slovak lowlands. Land reclamation which had to be carried out there for several reasons was based on the exact documentation and scientifically conceived projects which took account of the protection of nature. We could not afford to leave hundreds of thousands of hectares of fertile land regularly inundated every year lie fallow or to tolerate certain negative factors in the incidence of serious illnesses among the local population. We could not, however, carry out this

soil improvement project to the detriment of nature itself. We proceed in the same way in connection with the planned construction of waterworks on the Danube in which our best scientists, research workers and practitioners participate.

[Question] It is a well-known fact that great attention is paid to the problems of the environment in the Soviet Union....

[Answer] I recently read an article in MOLODOY KOMMUNIST entitled: "Why Will There Be No Supergiant on the Ob River?" It describes how the Moscow Hydroproject Institute, which designs the largest waterworks, proposed the construction of a gigantic hydroelectric power plant on the lower part of the Ob river. The project anticipated supply of very cheap electric energy--the capacity there would have been larger than of all hydroelectric power plants on the Volga combined. The reservoir above the dam would have been 1,000 km long, which is difficult to visualize in terms of our conditions. Two young workers of the Geographical Institute of the Soviet Academy of Sciences, however, who had done extensive research on the spot got involved in the whole affair. On the basis of their research and further studies they found that the construction of this waterworks would enormously damage adjacent nature and would have harmful effect on the extensive area of western Siberia. The controversy between the design engineers and ecologists was won by the latter. The State Planning Committee attached to the USSR council of ministers did not approve the project "so that people will not shake their heads in the future and a partial technical success does not ultimately change into immense damage." This is what the report says which gives the reasons for the rejection of the project. Both young scientists were awarded the Prize of the Leninist Komsomol not only for the scientific approach, but also for civic commitment.

Soviet ecologists have, indeed, gained powerful support for the laws on the protection of the environment and also in a well-known resolution by the Soviet government. They are supported--and this I would like to emphasize particularly in the interview with you--also in the press, in the mass communication media, in popular-science literature and also in scientific literature which is published in immense numbers of issues in the Soviet Union and tries to explain in a general way the fundamental problems of the protection of the environment to the broad strata of the population. The entire complex of problems involved was commented upon by comrade L. I. Brezhnev, who said at the 25th CPSU Congress: "Proportionately to the development of the national economy and to the increase in wages and industrial centers, it will be necessary to spend an increasingly larger amount on the protection of the environment." He said further that the Soviet Union will spend 11 billion rubles on the protection of the environment in the current five-year plan alone and that this amount will further increase. The examples from the Soviet Union should be a good, not only a formal example for us.

[Question] Certainly, it is not possible to say unequivocally that only the socialist states are interested in the problems of the environment.



When we think of this problem in a wider context, then it is indisputable that socialism creates relatively the most favorable conditions for comprehensive and, in comparison with capitalism, also substantially better solution of the problem of the environment and its protection....

[Answer] Life itself commands us to pay attention to these questions. The technical press reported recently that the United States wanted to reduce the risk of water pollution along the American coast. The U.S. government therefore also prepares, among other things, new directives for tankers heading for the American harbors. According to these directives, all tankers must have a double bottom and must use separate reservoirs for water ballast which should reduce the risk of crude oil escaping into the sea. There is, of course, no doubt about that the socialist states possess objectively better conditions for the protection of the environment. The socialist states have made care of the environment an integral part of their policy. In capitalism, motivated exclusively by profits, the entrepreneur tries to reduce the manufacturing costs at any price regardless of society's interest. Let us recall in this context the recent cases of toxic gaseous emissions escaping from the chemical factory in Italy or unrestrained dumping of crude oil-polluted water into the rivers and seas or other instances sporadically reported in the press such as the last instance of polluting the North Sea by crude oil escaping from production facilities. In socialism, the individual and the collective cannot have different interests because the principle of identity of interests of the individual and of the society is observed. After all, the example of our society bears witness to that fact....

[Question] We know of the negotiations by the states adjoining Baltic Sea whose representatives, on the initiative of socialist states, meet every year in order to confer upon the way in which this shallow sea is to be saved from the threatening pollution. In this context, the following idea occurred to me: how is it with the Danube, with the purity of water of that river which flows through several countries?

[Answer] For the administration of our water resources, the Danube is of extraordinary importance as an irreplaceable and interchangeable source of water in the CSSR. It enters Czechoslovak territory as a mighty river whose average annual flow exceeds 63 billion cubic meters. The planned utilization of the Danube water for the needs of industry, agriculture and population will have a big impact on the Czechoslovak economy. The infiltration of the Danube's water into the gravel alluvia of Zitny Island, which provides an enormous source of drinking water in this area, needs to be considered crucial.

For a better illustration of the Danube's importance here are a few data: The static supplies of underground waters are estimated at 12 billion cubic meters, but dynamic supplies can guarantee a continuous withdrawal of 17-20 cubic meters of water per second. The Tentative Plan for Administration of Water Resources considers it as a possibility that more than one third of

Slovakia's population could be eventually supplied with drinking water from Zitny Island. For these reasons, the protection of Danube waters and thus also of the underground water of Zitny Island is so important and we emphasize it all the time. To make the Danube water pure, we must construct a network of purification stations for waste water dumped into the river and we must therefore be especially careful when planning new industrial plants in this area. For all these reasons, the Comprehensive Program of Further Intensification and Improvement of Cooperation and Development of Socialist Economic Integration of CEMA Member Countries adopted at the 25th CEMA session recommended that the interested CEMA countries work out proposals for the long-term comprehensive expansion of cooperation in the solution of the problems pertaining to the Danube watershed. Within this general project, attention is focused on the protection of the Danube waters from pollution, to the economic impact of the Danube watershed and to the questions related to the reduction of damage caused by floods and inundation along its banks.

The greatest progress so far has been achieved in the work on the draft agreement on the protection of the Danube from pollution. In accordance with the decision of the CEMA Executive Committee it is anticipated that all states along the Danube will participate in the solution of this problem. Should the states which are not CEMA members not be genuinely interested in signing an agreement on the protection of the Danube waters from pollution, then the CEMA member countries will try to find a mutually advantageous solution themselves. The purity of the Danube waters is also protected by bilateral agreements. For example, we work very closely with the Hungarian People's Republic and we must say that this cooperation has a tendency toward further intensification. We have an agreement with Austria on the protection of the purity of the Danube's waters, but water which comes from that territory to our country is not improving; on the contrary it contains an increasing amount of impurities, especially of crude oil material.

[Question] There are several areas in Slovakia which are seriously threatened by air pollution. Although these seriously affected areas constitute only a fraction of the total territory of the Slovak Socialist Republic, the situation is aggravated by the fact that these areas are densely populated. The unfavorable context between the seriously polluted air and a big concentration of the population is most conspicuous in Bratislava. What measures are taken or will be taken to improve this situation particularly in the capital of Slovakia?

[Answer] State and party organs pay systematic attention to making these areas healthier. The SSR government, for example, dealt with the problems of the environment in Bratislava also this year. This care for the environment is of a long-term nature. Eighty-seven extensive projects for the protection of the environment and for the improvement of air purity at a total cost of Kcs 900 million were carried out on SSR territory during the Fifth Five-Year Plan alone. Likewise, many major investment projects are planned

for the Sixth Five-Year Plan: there should be 33 of them altogether, some of which have already started. The facilities which have already been constructed have benefited Slovakia with a gradual reduction in the industrial fallout of solid matter although additional industrial power generating facilities are built and additional areas are settled. This result was largely achieved through the use of new, very efficient separators and by some additional measures. In Bratislava, for example, the switch by power plants to residual fuel oil and the use of gas for heating additional houses has resulted in the 60 percent reduction in fly ash fallout. Considerably worse is the situation in regard to the gaseous fallout. We have not yet succeeded in devising a method that is effective from the standpoint of production and economically feasible for collecting sulfur dioxide which pollutes air very much. Certain possibilities for reducing the amount of gaseous industrial fallout lie in the modification of existing technologies or in replacement of older, obsolete and polluting technologies by modern technologies with less fallout.

In terms of the possibilities for improving the purity of air, Bratislava is in a rather unfavorable situation: almost half of chemical industry of the Slovak Socialist Republic is concentrated there and, in addition, its population is 330,000. Air pollution is made substantially worse by the big concentration of automobile traffic as well as by the fact that higher stacks cannot be built because they might interfere with the safety of air transportation. It is imperative to improve the atmosphere in Bratislava substantially within the shortest possible time. The possibility of doing so, however, is complicated by the general shortage of the low sulfur content fuels which have to be used in the power-generating equipment in production enterprises. For this reason it is necessary to pay systematic attention to the location of new industrial plants in the city area. These problems were dealt with by the SSR government at its session at the beginning of the year. It ordered the mayor of Bratislava not to permit the expansion or the establishment of those manufactures which pollute the environment, but to support those which are not expected to emit any harmful matters. In cooperation with the appropriate ministries, the mayor has to work out a concept for the comprehensive protection and improvement of the environment in Bratislava by the end of this year.

[Question] We are of the opinion that in dealing with the problems of the environment we must also orient our attention to the implementation of short-term measures--to the improvement of housing and work environment, to increasing the cleanliness of our towns and villages, enterprises, plants and cooperatives. These precisely are the problems which can be solved without large investment costs and often immediately with the assistance of all citizens. It is certainly possible in this context to point to a number of instances when precisely the workers' initiative was the most active force in the solution of the problems involved....

[Answer] The key measures which the SSR government adopted by its resolution on the Comprehensive Concept of Care for the Environment up to 1990 are

focused on making our atmosphere, water and soil healthier, on combatting noise and vibrations in the five most threatened areas of Slovakia. Accomplishing these goals will require a great deal of time and investments. It has been estimated at the same time, however, that approximately one quarter of problems of the environment could be solved through the committed, active attitude of workers in industrial plants and of all inhabitants of towns and villages. National committees have developed exemplary initiative towards the improvement of living environment. The results of implementation of election programs of the National Front are encouraging. During the Fifth Five-Year Plan for example, there were constructed 3,511,000 square meters of green areas, 77 smaller reservoirs for water, 1,557 km of water supply lines and sewers, 100 bathing establishments and swimming pools. Apart from several spas, particularly successful in this respect were the workers of the industrial plants Duslo Sala, Chemko Strazske, Drevoindustria Zilina, Drevina Turany, South Slovak Pulp and Paper Mills and many others. These are just beginnings--they are beautification projects carried out largely in the entrance areas of industrial plants. An interesting example was set by the SNP [Slovak National Uprising] Plant at Ziar nad Hronom where, with the assistance of the Forestry Research Institute in Zvolen, they have started to plant trees resistant to industrial fallout. A successful beginning has also been made in planting trees and shrubs in the farmsteads of some agricultural cooperatives and state farms. The green areas around the production centers certainly are of great importance not only from the esthetic and sanitary standpoint, but also because they enhance the possibility of protection against fires, reduce noise and improve microclimatic conditions, particularly in summer.

Another of our wishes is that national committees and other organizations of the National Front follow the example of the Okres Committee of the Slovak Union of Women in the Levice Okres which, with the slogan "Let Every Village Be Full of Roses," wins over its members for the constant beautification of villages, for forestation of bare spots and for the construction of small reservoirs for water.

In conclusion, I would like to say that in protection of living environment we must see not only objective, but also subjective conditions, specific factors and shortcomings. It is necessary to eliminate the causes of indifference, apathy, lack of discipline and inconsistency in the solution of these questions. If we overcome these subjective problems and make use of the objective possibilities offered us by the socialist system, I am convinced that the forecast is optimistic--that we shall succeed in bringing about a situation whereby we shall owe nothing to the generation which will come after us.

10501  
CSO: 5000

COLOMBIA

VEHICLE EMISSION CONTROL DEVICE PATENTED

Bogota EL ESPECTADOR in Spanish 21 Aug 77 p 17-A

[Article by Edgard Caldas Vera: "Catalytic Converters"]

[Text] The minister of economic development through the Industry and Commerce Office, Industrial Patents Division, approved a patent for the commercial exploitation of catalytic converters that prevent air pollution from vehicles.

This announcement was made public by the inventor, Alvaro Rojas Mejia, who revealed that after 32 months of study by that office his invention was finally accepted.



Alvara Rojas Mejia,  
inventor

## Many Obstacles

He explained that the officials at first did not believe the effectiveness of the catalytic converters but, after seeing them operate, they changed their minds.

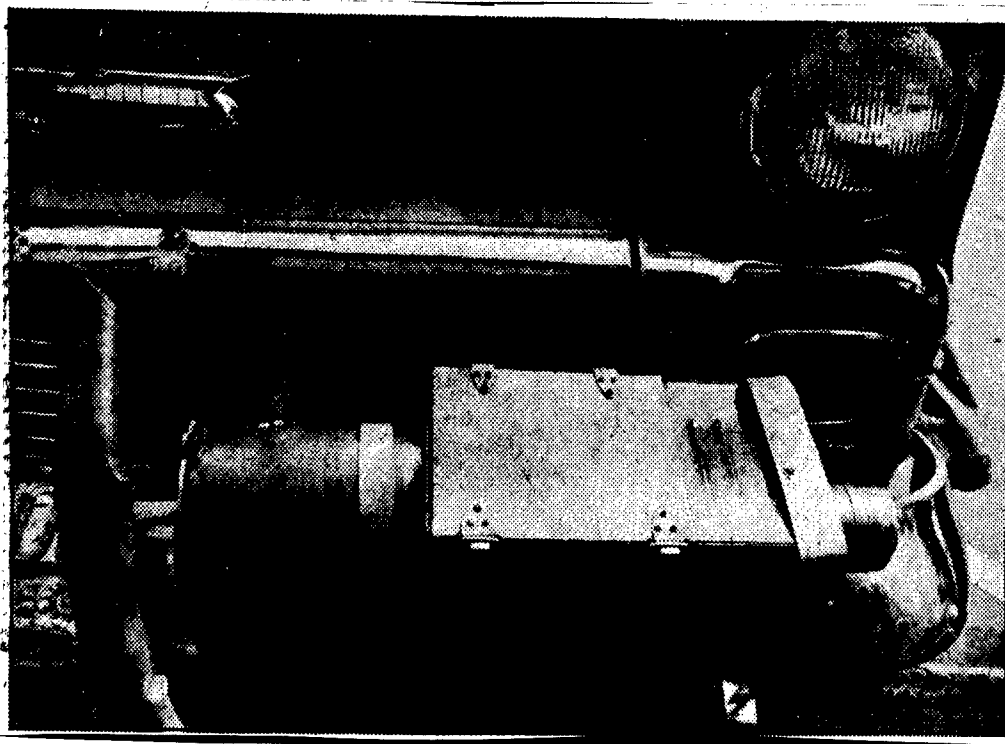
He commented that there were many obstacles from the people in charge of determining the validity of the invention. "I even had to act as a lawyer to expedite procedures."

The patent went into effect 22 July 1977 and lasts until 1985. In this way the inventor can construct as many devices as he wants during that period.

## Start a Company

"After so many sacrifices and so many nights spent thinking about my invention, I am very satisfied in having achieved success not only for myself but for humanity. However, I need one wealthy person, from the governmental sector or private enterprise, to finance me in starting a company," he stated.

Alvaro Rojas Mejia is a meek-looking but very intelligent man. He has been an indefatigable fighter for his cause in spite of the fact that many people thought he was crazy at the beginning.



A catalytic converter can be seen on the bumper of this small truck. The device has been tested with great success. There are 12 models.

He added that the production of catalytic converters will mean new jobs and will train many Colombians in environmental health and ecology.

There are 12 models of this device which can be adapted to the characteristics of the vehicle. In other words, the device that is placed on a truck is totally different from one for a van.

#### Great Deal of Exhaust

In 1959 Alvaro Rojas drove a tractor. He soon realized that it produced a great deal of exhaust which affected his health. "I attached some cannisters to the exhaust pipe which absorbed the toxic by-products of the fuel. This led to the idea of creating the catalytic converters to purify the exhaust," he stated.

In the economic study that Alvaro Rojas made, he revealed that the device will cost about \$189 for eight-cylinder vehicles and \$162 for six-cylinder vehicles. Vehicles that weigh 4 tons and more can fight pollution with "my device which will cost between \$216 and \$324 for those types of vehicles."

#### Between 6 and 10 Million Pesos

The inventor needs between 6 million and 10 million pesos to begin large-scale production.

"I was confined for some time in the National Model Prison because of a civil problem. I continued thinking there about the way to perfect my idea until I constructed the first three models out of wood. Later when I left prison, I had a very clear idea about the converters and I proceeded to make samples out of metal," he added.

#### She Was the Only One

Alvaro Rojas said that he had worked on the catalytic converters for approximately 19 years and only one person supported him from the beginning--his wife. "She was the only one who did not believe that I needed a doctor to cure my alleged dementia," he revealed.

Alvaro Rojas studied chemistry and pharmacy from 1944 to 1946 at the Policarpa Salavarrieta Military Health School. This helped him in the construction of the converters.

7717

CSO: 5000

OIL PIPELINE PROJECT, SEA POLLUTION DISCUSSED

Cairo AKHIR SA'AH in Arabic 15 Jul 77 pp 21 - 22

[Article by Khayriyah Khayry: Voyage of the Black Gold from 'Ayn al-Sukhnah to Sidi Kurayr"]

[Text] What is the truth behind the rumor about polluting the seashore?

With the aid of the most advanced electronic control systems the black gold is transported across a long and new route from 'Ayn al-Sukhnah on the Red Sea to Sidi Kurayr on the Mediterranean. And with youthful Egyptian fingers and trained brains, this electronically complicated project has been implemented from beginning to end. How is it done? And how does the operation proceed?

Six months have passed since the opening and operation of the \$500 million Sumed oil pipeline. It is designed to transport the crude oil of the Arabian Gulf area from the Red Sea to the Mediterranean across a long route in Egypt. Pipelines have become the 20th century way to transport many raw materials, for example coal and iron after melting [sic] them because this is faster and cheaper than the large oil tankers and other transport methods.

The length of this route of the crude oil from one seashore to another is 320 kilometers. It is the alternative route for the tankers that go around the Cape of Good Hope. As a result of the closing of the Suez Canal the oil companies built a fleet of giant tankers to transport oil to the Western markets across that route... This in turn resulted in a rise in transportation costs which were added to the rise in oil prices. Also, in their design of oil tankers, the shipbuilding companies did not take into consideration future plans for deepening the canal.

When the canal reopened, the Suez Canal Authority began its deepening operation to accommodate the navigation of tankers with a tonnage of 250,000 or more. Then came the oil pipeline project complementing the Suez Canal service to the giant oil tankers and to reduce the traffic pressure on the canal. In this way transportation costs were lowered.



In terms of time span, the Sumed pipeline is still in its infancy. It is a giant project which will be completed in stages. Built by the Arabian Pipeline Company, this project is designed to transport 120 million tons of crude oil. At the present time, however, it is ready to transport 40 million tons yearly which will be increased gradually to 80 million tons. Then, after an expansion stage which will require new construction, the pipeline will reach its full capacity.

#### Hurdles at the Beginning

If we examine the operations of the first 6 months of the pipeline, we find that it has successfully passed the testing stage required before it can operate commercially. And it has been proven that the pipeline is operated and administered efficiently. The Sumed Pipeline Company bought one million tons of Saudi light crude which has been transported through the pipeline from 'Ayn al-Sukhnah to Sidi Kurayr, then exported and sold in the west European markets.

And by mere chance the Sumed Company was lucky in its first operation where it bought the million tons of crude just before the recent oil-price increase and sold it after that increase, making an extra profit in the deal. Also there are several long-term contracts with three international oil companies, Exxon, Mobile and Petrofina to transport 20 million tons yearly which amount to half the present capacity of the pipeline. Three million tons of crude have already been transported for these three companies by the pipeline, with the delivering and receiving tankers at a capacity between 120 and 280,000 tons.

Even the individual operation of 200,000 tons for Latsis, the Greek businessman, has its importance in spite of its very small size, because every operation carried out by the Sumed pipeline is considered attestation to the safety and competence of its operations regarding the international oil market and the pipeline's future clients.

#### A Trip With Egyptian Hands

The trip of the black gold (crude oil) by pipeline from the shores of the Red Sea at the Suez Gulf to the shores of Alexandria at Sidi Kurayr follows exact successive steps. From beginning to end, the major role in such a trip is divided between advanced electronic gear and the trained hands of the Egyptian technicians who scientifically studied this advanced machinery and who have had wide experience with it.

The trip begins with a radar message received by the first station at the Red Sea port of 'Ayn al-Sukhnah from a tanker which is 500 kilometers from the shore. This radar station is considered the backbone of the pipeline that covers all its parts from beginning to end and for 500 kilometers off both shores. Through this station come the orders to operate the electronic control systems.

A message announces the name of the tanker, the tonnage, type of crude oil it is carrying, and the arrival time. The reception station at 'Ayn al-Sukhnah replies that it is ready to receive the tanker. This is followed by another message when the tanker is 50 kilometers away announcing its location. The control officer designates the time and the location of the meeting between the Sumed boat and the tanker, and the number of the pier that is ready to receive the tanker.

As a beginning, the Sumed Company has three floating piers spread out 5 kilometers from the shore, two of which receive tankers with a capacity of 280,000 tons and the third one 120,000 tons. The piers are equipped with floating hoses to be connected with the tanker's storage basins, and the piers' bottoms are connected to underwater pipes which in turn connect with the pipeline on the shore.

#### "All Is OK" and the Trip Starts

After the Sumed pilot meets the tanker, he goes aboard and directs it to anchor beside its assigned pier. The pier hoses are raised and connected with the tanker's storage basin and the rear-end valve on the pier is opened. Then the tanker calls the station announcing "all is ready," that it is ready to push forth the crude oil. At the same time, the control officer has already prearranged the route of the crude and opens the valves and prepares the assigned storage area for the specified incoming crude oil. The station announces "all is ready, start the pressure." The tanker starts its pumps to push the crude through the floating hoses to the pier, to the underwater pipes, and then to the shore. The crude passes through the measuring systems to register the quantity, type, and on the assigned storage tanks at the station. There are 12 storage tanks at the reception station and another 12 in the send-off station at Sidi Kurayr. The Sumed pipeline is prepared for servicing three types of crude oil, and that is why every storage tank is designated for a specific type to prevent any intermixing.

When all the crude is received, all the valves are closed and the tankers' pipes are carefully disconnected without spilling a drop in the sea to avoid polluting the shore.

The pipeline is designed to serve several tankers at the same time, equal to the number of piers in both the reception and send-off stations, three in the first and five in the latter. Also, it is designed to transport three types of oil at the same time without mixing or contamination. They are: Arabian light, Iranian light and Kirkuk. Actually, this mode of transport of the crude oil is similar to the movement of railroad trains, where on the train there is separation between passengers of the first, second, and third classes, where each class has its own special compartment. The Sumed pipeline separates each type of crude oil by timing its transport where each type is isolated by a time duration before it is followed by another.

## 320 Kilometers of Pipeline

The length of the route for the oil between the storage depots at 'Ayn al-Sukhnah to the ones at Sidi Kurayr is 320 kilometers, and it follows a specially scheduled relay of different mechanical systems that push the petroleum through the pipeline. The trip takes 36 hours where the oil gushes with great force to cover such a distance. The pumps at 'Ayn al-Sukhnah station have the horsepower of 44,000, which makes it one of the largest pump stations in the world. The electric network which supplies all the systems of the pipeline has a 220 voltage, and both the reception and send-off stations are connected with over-ground electrical cables.

After the chief of operations has pressed all the numbered keys to open 13 valves along the length of the pipeline, the oil leaves the storage depot and pushes through the pipeline. The crude flows through a twin pipe which is buried one meter underground; it leaves 'Ayn al-Sukhnah directed westward to the desert, then it crosses the Nile south of Cairo and continues toward the northwest crossing the several canals of the land reclamation projects. Then the pipeline crosses under the surface of Lake Maryut until it reaches the storage depot at the Sidi Kurayr station west of Alexandria and waits to be shipped off.

The send-off station at Sidi Kurayr receives a message from the tanker which will reload the crude announcing its arrival 24 hours before it gets there. The same reception procedure as at 'Ayn al-Sukhnah is repeated at Sidi Kurayr. At this station there are five floating piers, two of them service tankers with a capacity of 270,000 tons and the rest with a 120,000 ton capacity. The piers are from 4 to 8 kilometers from the shore.

As soon as a tanker arrives, an expert boards it to test its stored water before the tanker releases it into the sea. It is a condition which the Sumed Company included in the contracts with its clients that the tanker storage and the water in it must be clean to prevent polluting the shore. This condition will continue until the Sumed Company finishes its anti-pollution project, estimated at \$40 million. This project is considered one of the most technologically advanced of its type.

Sidi Kurayr's control center electronically schedules the shipping of the crude oil where the pumping station draws the oil from the storage depot passing through a registration system to measure the quantity and the type of the crude, to be sure that it is the same that was received at 'Ayn al-Sukhnah. At the send-off station the oil flows in reverse order. It goes from the shore pipes to the ones under the sea, to the inside of the floating pier then to the floating pipes which are connected to the tanker's storage areas.

The tanker's pointer begins to sink gradually under the water while the oil flows into the tanker's storage areas, and this flow gradually slackens

until it is full at the designated quantity where the pump stops and the valves close one after the other. After an exchange of "all completed...OK" between the tanker and the chief of operations at the shipping station, the tanker leaves the Mediterranean shore on its way to Western Europe...

#### Sea Water Not Polluted

The shore waters of Sidi Kurayr remain clean, in accordance with the international agreement signed by Egypt to protect the Mediterranean and the Red Sea waters against pollution. In implementing the provisions of this agreement, the Sumed Company contracted a foreign firm to inspect the tankers' storage water before releasing it into the sea and to use helicopters in surveillance from the air against pollution incidence.

A final word about a rumor in the international press accusing the Sumed pipeline of polluting the Alexandria shore and estimating that the daily spillage is between 10 - 150,000 tons of oil. This unbelievable figure invites suspicion about the motive of the source of the news item. First, this figure is fictitious because the price of one ton of oil is about \$90. Second, by a simple computation of multiplying this amount with the number of days in a year it would amount to millions of dollars, which is unacceptable to the oil companies or logic.

For this reason there are some who see that tourist companies are behind the rumor because it is in their interest to discourage people from buying land on the Mediterranean shore. This way the land prices in the tourist areas will go down because of less demand, and the companies in turn can exploit and buy the land at prices of their own determination to serve their interests and not the interests of the landowners.

What is important here is Sumed's answer which is an open invitation to everyone concerned to inspect the shores at the area of Sidi Kurayr or the 'Ayn al-Sukhnah, to be assured that the region is clean.

9125

CSO: 5000

ENVIRONMENTAL PROTECTION IN RYAZAN'

Moscow IZVESTIYA in Russian 20 May 77 p 2

[Article by N. Chumakova, chairman of the Executive Committee of the Ryazan' City Council of Workers' Deputies: "From Accounts of Local Councils--The Air and Water Will Be Clean"]

[Text] Even a small river makes a city more attractive. But such a beauty as our blue-eyed Oka is an adornment of ancient Ryazan'. It extends more than 30 km in the city and its shores are favorite spots for rest and recreation of the city dwellers.

It is not easy to preserve the river's purity in such a major industrial center as Ryazan'.

"How is it that the city council is so successful in conserving nature and protecting the purity of the river's water? What's the secret?" These are questions asked of me at the Dresden colloquium of European burgomasters...

"The secret is in our procedures, in our system," I usually answered.

"It is possible to use nature in various ways," stated general secretary of the CC CPSU, Leonid Il'ich Brezhnev, at the 25th Party Congress. "It is possible--and the history of mankind has many examples--for man to leave himself with infertile, lifeless, and hostile space. But comrades, it is possible and it is necessary to enrich nature, to help nature more fully cover itself with vital forces. We are all familiar with the simple expression 'land of milk and honey.' Such is what lands are called where knowledge, the practices of the people, their attachment and love of nature in truth create miracles. This is our socialist way."

In carrying out the laws and decrees on the protection of nature adopted by the party and the state in recent years, the city party committee and city council of workers' deputies resolved to achieve a complete cessation of dumping impure industrial and municipal sewage water into the Oka and its tributaries, as well as harmful discharges into the atmosphere. The managers and specialists of the industrial enterprises and municipal economic

services submitted measures to the permanent commission of the city council for the protection of nature. These measures can guarantee the assigned aim. At the executive committee, at a council session, the plan for every plant and association was thoroughly examined.

The deputies proposed a plan to the lime brick plant to include construction of sewage water pumping station into the municipal sewage conduit. This station has already become operational.

At a session a complex environmental protection plan was approved.

The permanent commissions on the protection of nature, the executive committees, the deputies of four regional councils and the city council have taken control over completion of the plan. It would be impossible to say that making this a reality would be easy to achieve. But the deputies, the sanitary inspection workers, workers of the Moskva-Oka basin inspectorate, and active public affairs workers have been steadfast and consistent. Environmental protection questions have been discussed three times at a session of the city council and 14 times at sessions of the executive committee and the permanent commission on the protection of nature. The deputies made concerted efforts in checking on the construction of sewage treatment plants. Members of the permanent commission on the protection of nature of the city council were especially persistent and purposeful in their actions. This includes V. Lakomov, mechanic of the Ryazan'zhilstroy housing construction trust; A. Gordeyev, lathe operator; N. Ulyakov, machinist at the machine-tool building plant; A. Nazykov, chief of the laboratory of the Ryazan' non-ferrous metallurgical plant Ryaztsetmet, and others. A check of the motor pool of the central transportation construction association TsentrRyazan'stroytrans showed that the enterprise was delaying construction of local sewage treatment plants. The motor pool managers had to submit to questioning at a session of the executive committee of the city council.

Several ministries and departments have not supported the decisions of the council on environmental protection as they should have. The Ministry of the Chemical Industry, for example, did not distribute funds to their own enterprises for building sewage treatment plants. Concerning this, the deputies conducted an inquiry and were successful.

The city committee of the party exercised control and held responsible the managers of enterprises that avoided fulfilling the decision of the city council.

A great deal of organizational work was productive. All plants, combines, and associations built their own local sewage treatment plants. Activated was a modern municipal biological sewage purification station with a capacity of 320,000 cubic meters daily. And what is important, they raised the responsibility of economic managers to see that water and air are not polluted. For example, at the petroleum refinery protection of the water and air basin has become part of all industrial activities. It turned out that it is

possible to reduce by one quarter, in comparison with the plan, the consumption of fresh water, and to bring water recycling up to 95 percent. All sewage water passed through complete mechanical and two-stage biological purification. The quality of the sewage water after going through the station's tertiary sedimentation tanks for biological purification does not disrupt the river's sanitary system. At another large-scale enterprise, the non-ferrous metallurgical plant Ryaztsvetmet, adherence to the standards for discarding sewage water has been included in the evaluation of the industrial activities of the shops. In the long run the results can only be encouraging. The city has stopped discharging impure sewage into open bodies of water and the quality of water below Ryazan' is the same as the water above it. The Oka has become clearer. In its waters in the boundaries of the city sterlet have appeared anew.

This, of course, does not mean that the city's executive committee and the regional councils no longer have cares or worries about this. This is by no means true. They must keep an eye on the economic expenditure of clean drinking water by the enterprises and keep track of the efficiency of the work done by sewage treatment plants. For example, the deputies have established that the rubberoid board plant and the calculator and analytical machine plant are still using too much drinking water for technical purposes. This question was discussed at an expanded session of the permanent commission. The question was put to the plant about the best use of water after going through the municipal biological purification station.

For control over work efficiency of the sewage treatment plants at the enterprises, 26 sanitary and hygienic laboratories were set up. The laboratory workers at the petroleum refinery watch over the quality of the sewage water not only of their own enterprise, but of the entire Southwest Industrial Complex. Having observed dumping above the standards, they make this known to the enterprise managers and the inspecting organizations. According to a proposal of the deputies, at the water pipeline and sewage economy administration a sanitary and hygienic laboratory was set up. It exercises control over the sewage water at all enterprises in Ryazan'. M. Sinel'shchikova, head of the laboratory informs the municipal sanitary and epidemiological station, the Moskva-Oka Basin Inspectorate and the executive committee of the city council about every violation of the sanitary standards. Such widespread and permanent control disciplines the economic managers.

Even the sky above Ryazan' has become cleaner. At the petroleum refinery, at the Ryaztsvetmet plant, and at other enterprises new technology has been introduced which allowed for lowering exhausts into the atmosphere. Two asphalt plants were removed beyond the city. More than 100 gas purification and dust trapping devices which neutralize more than 70 percent of the emissions were built at the industrial enterprises. There are less fumes from the boiler room flues. Some boiler rooms have been changed to gas, others completely closed down since homes have been switched into the central heating plant.

There is still much work ahead. Advanced technology is needed in a number of industries. Plant modernization is lagging at the acid-resistant plant Kisloupor, due to failure to complete the plan for building dust trapping devices.

It is estimated that a hectare of earth planted with vegetation can retain 60 tons of dust daily. In Ryazan' there are more than 3,000 of these green hectares. For every inhabitant there must be more than 40 square meters of parks and squares. The deputies continually help the landscaping trust. They have insisted on creating a specialized sovkhos in the city for "decorative crop." It raises nursery plants and flowering seedlings.

All major industrial enterprises have protective sanitary zones. The complex of industrial enterprises in the southern portion of the city is separated from the inhabited zone by a four km strip. Unfortunately, not all plants situated here are involved in landscaping as they should be. In particular, such censure could be directed at the ruberoid board plant. The protection of all populated quarters from the industrial complex by a four km green barrier is the immediate task of the council and the deputies.

At a session of the city council a long-range plan for improved environmental protection was examined and approved. Planned was increasing the capacity of the biological purification station, and establishing a closed cycle system in it which will provide the opportunity by the end of the five-year plan of returning 60,000 cubic meters of purified sewage water for use at the enterprises. Plans call for expanding the protective sanitary vegetation zones of the leather plant, the agricultural machinery association Ryazsel'-mash, and other enterprises; and updating and putting the protective zone in the southern portion of the city in good order.

Here it would be appropriate to say that the experience accumulated in organizational work on environmental protection and in educating on the regard for nature can place the newly convened city council and its deputies in good stead.

Ancient Ryazan', occupying the former outlying districts, is growing, expanding. It requires more rapid development of the means and methods for environmental protection. It must be stated that sewage treatment plants and gas trapping devices are still not sufficiently effective and their costs are high. Before the scientists and designers working on this very important matter is the task of creating cheaper, and importantly, more efficient means and methods for protecting the water and air basins of our cities.

A prudent regard for nature in our country--this is a matter of governmental importance. The councils and deputies of Ryazan' will henceforth consider environmental protection as an urgent part of their activities.

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## TANKER TERMINALS, SEA POLLUTION

Moscow MORSKOY FLOT in Russian No 7, Jul 77 pp 34-35

[Article by N. Plyavin, leading designer of the Black Sea Central Planning and Design Office, captain of ocean-going vessels, candidate of technical sciences: "Tanker Terminals and the Prevention of Sea Pollution"]

[Text] All the existing diverse equipment and devices designated to prevent pollution of sea environment by petroleum and petroleum products can be divided into three basic groups: to prevent oil spills, to localize oil spills, and to eliminate the aftereffects of an oil spill.

With what devices should a tanker terminal be equipped?

Tanker berths are outfitted with equipment and devices in conjunction with the presently active International and National Safety Laws. The ship and shore cargo line systems during cargo, bunker and ballast operations are interconnected using elastic hoses or by systems of metal pipes (stand pipes). This intermediate link between the cargo lines on the shore and ship are, practically speaking, a most vulnerable area. Here hose ruptures and breakdowns in the stand pipes often occur which, as a rule, lead to oil spills.

A cargo hose rupture or a stand pipe breakdown takes place for different reasons: when there is excessive ship displacement along moorage or during ship departure from moorage under the influence of wind or current, when a great listing of the ship is created during the loading process or when there is a quick change of the ship's draught, but the most frequent occurrence of this is due to sharp increases of pressure in the loading system.

Providing the tanker moorage with cargo hoses and stand pipes that should respond to the safety rules is the responsibility of those administering the mooring place. The tanker captain can refuse to feed the ship's cargo hoses which, upon superficial examination, has been noted to have some defects. At present greater demands on the quality of cargo hoses and stand pipes are being made.

In accordance with international requirements, the manufacturer issues a certificate for every hose. The hose cannot have external defects such as dents, fractures, grooves, gashes, etc., nor internal damage which might be revealed upon examination from both ends of an open hose. When under pressure the hose cannot deform excessively, bulge or leak. Once a year the hoses are tested under pressure. The following markings must be on the hose itself or on a certificate: designation of petroleum product, purpose to be used for; date of manufacture; rupture pressure; extent of operating pressure; and date of last inspection with the designated pressure under which it was tested.

In addition to this, for example, according to new American national laws the following requirements have been made on hoses: the minimum rupture pressure stated by the manufacturer must be equal to 600 lbs/square inch (42.5 atmospheres) or higher; the hose's rupture pressure must not be less than four times that of the automatic safety valve while present in the cargo handling system or quadruple the minimum forced pressure plus the pressure of the hydrostatic pressure head of the oil pumping system at the hose installation point if safety valves have not been installed; the manufacturer's recommended operating pressure for every system must amount to 150 lbs/square inch (10.6 atmospheres) or more and be greater than the pressure in the safety valve (or the maximum of the forced pressure if the safety valve has not been installed), plus the pressure of the hydrostatic pressure head of the oil cargo pumping system at the point where the hose is installed.

If stand pipes have been installed at the mooring they must move freely with the motion of the ship. The shore workers inform the captain's cargo assistant about movement limitations of the stand pipe in terms of length and list angle. The stand pipes must pass each other cleanly. If a leak should appear in the connection the corresponding stand pipe is immediately taken out of operation and repaired. The fastening screw clamps must be reliable and well triggered. A must condition in working with stand pipes is that the ship's mooring hawsers have to be kept in a tight condition to prevent movement of the vessel, the hawsers have to exceed the permissible limits of movement for stand pipes. Every stand pipe must have the means for its own drainage or a shut-off valve before disconnecting from the ship's pipeline after terminating the cargo operations.

For collecting oil that might spill during hose separation the mooring has a collection device at the hose receptacles. If the diameter of the cargo hoses is 12 inches and more, the capacity of the oil collecting device cannot be less than 1.2 tons.

The shore cargo mainline is equipped with an automatic safety valve so that accidental shut off of the wedge-shaped closure on the tanker during loading does not cause an increase above the established pressure that might lead to hose rupture or damage to the cargo pipeline and an oil spill.

At a place on the shore where the cargo pumps are situated more than 100 meters from the mooring automatic safety valves are installed to eliminate an

increase in pressure which might bring about inertia of the load current in the long shore pipeline when a quick shutdown of closures takes place on the ship.

At the tanker moorage safety switches for the shore cargo pumps are installed in case of emergency shutdown. Besides this, every shore pipeline at the mooring must have an emergency closure installed 30 meters from the hose receptacles in case of fire or accident when the shore receiving closures at the hoses might be inaccessible or damaged.

The shore cargo pipeline designated for the loading of ships must be designed so that during normal operations a sharp increase in pressure from hydraulic impact (for example, when the closure shuts quickly on the ship) might not cause damage to the stand pipes on the cargo hoses. To achieve this in long shore pipelines operating with high output loading, a device is recommended in the region of the mooring having an overflow reservoir for the purpose of absorbing the excess pressure as a safety measure whereby the pressure in the pipes and cargo hoses might be decreased to safe levels.

At the mooring the shore pipeline designed for receiving the cargo or the polluted ballast from the tanker must have a check valve that closes automatically when the pressure from the ship will be lower than the constant pressure from the shore. For example, while receiving cargo or polluted ballast in the reservoirs located at a high elevation, such an automatic valve will not provide the opportunity for having a large oil spill into the sea if the cargo hose or one of the stand pipes bursts.

The shore pipeline is equipped with an instrument or an automatic recorder that shows the speed of the cargo flow as a means of precaution against increased speed and the formation of static electricity.

On the oil pipes at the mooring it is essential to install monometers preferably with automatic recorders and an automatic alarm signal that is triggered when the actual pressure exceeds the permissible level.

In conjunction with this, many modern tankers have remote-control systems for managing load operations and the load capacities have increased. American national laws require that the oil mooring have emergency devices making it possible for the captain's cargo assistant on board the ship from his normal duty station, for example, from the central control station, to immediately cease the flow of oil being fed on the tanker.

Every tanker engaged in loading and unloading is surrounded by special floating boom defenses so that in case of an accidental overflow of oil there will be no possibility of spread throughout the entire water area of the port.

A tanker terminal must have floating oil collectors or floating devices on hand for collecting oil overflow into the water area, and at the same time

in the shortest time possible can eliminate the fire danger that arises and keep to a minimum the sea pollution that has taken place.

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SWEDEN

ALARM OVER USE OF ASBESTOS 'SUBSTITUTE'

Stockholm DAGENS NYHETER in Swedish 25 Aug 77 p 24

[Article by Birgitta Albons: "The Ban on Asbestos Applies Only to Places of Work"]

[Text] It is entirely legal both to import and to sell asbestos products which are not allowed to be handled at places of work, as long as the materials are marked so they do not go under a false description of goods. The labor protection authorities can only step in against those employers who let employees handle the products. And a private person can both buy and handle asbestos in any amount completely legally.

It is therefore the construction company which is responsible in the case which was discovered on Tuesday when a protection representative from the construction workers association discovered eight workers insulating with asbestos cloth at a building site in Vanersborg.

Pure Asbestos

The material they used is called Fortex, and the employer maintained when asked that it is a material which replaces asbestos. But it is a pure asbestos product, which was available even before prohibitions and restrictions on the use of asbestos started coming out in 1975. The product is the same now, with the difference that the cloth has been bleached.

"Of course we cannot say whether the product was bleached to conceal the fact that it is pure asbestos cloth, but we have now found out that the bleaching took place in 1975," says Bernt Lundberg in the construction workers association.

According to the labor protection administration, the importer who imported and sold Fortex has not attempted to use false designation for goods, but sent the text of the warnings along with the sales. And Fortex is not being sold any more now.

But the question is if it is sufficient to send along the warning text according to the law on goods dangerous to health and environment. According to that law, asbestos was classified as a dangerous material in December 1976.

In any case it helps the construction companies to deceive the workers if they want to. If the goods are marked permanently, then of course the construction workers themselves should be able to say no. "With regards to Fortex asbestos cloth, there is actually no legal field of application for it," says Sture Skylberg in the labor protection administration, who handles exemption cases with regards to asbestos.

"This product should probably be banned, but we are not authorized to do so. It is the purpose of the occupational inspections to make sure that it is not being used," says he.

#### Roundabout Ways

It is true that the wholesaler says that Fortex is not sold any more, but since there is no prohibition on selling or importing it, he can start selling again at any time. And for some industries asbestos is so desirable that it even gets in through the countries' borders in roundabout ways, according to an article in the latest issue of Byggnadsarbetaren.

In this article floor layers also criticized the labor protection administration heavily. They believe the administration too easily gives exemptions for asbestos mats. In some cases it is permissible to handle floor mats with asbestos on the rear side. This involves certain floor mats which are laid in kitchens and wet rooms.

Pure fraud also occurs among the sellers of mats. So-called cash-and-floor-mats must not be installed after the end of this month. This is clear from a report from the labor protection administration. A seller of mats in Herrljunga has sent the report along to his customers, but he himself wrote below on a typewriter that the permit had been extended and was valid till the end of 1978.

The legal office in the labor protection administration is now handling the case.

Allan Andersson in the labor protection administration's inspection department believes it would have been entirely reasonable with bans on both imports and sales on some asbestos products and proposed already when the asbestos alarms came in 1975 that all importers and manufacturers should be forced to apply for a permission from the administration. But this was not approved.

### Difficult To Control

He believed that a ban in certain cases would facilitate the work by the administration and the trade inspectors considerably.

"As it is now we must go all the time and mess around in customs papers to try to find out what is being imported so it will be easier for us to follow up and map out the application of asbestos. This is a roundabout way," says Allan Andersson.

He believes the product control board should take the initiative for this type of ban since asbestos is classified under the law as dangerous to health and the environment.

But in the product control board it is believed that the labor protection administration should take or maybe should have taken this type of an initiative. But it is the government which decides.

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SWEDEN

MISLABELED ASBESTOS "SUBSTITUTE" NOW FOUND NATION-WIDE

Stockholm DAGENS NYHETER in Swedish 24 Aug 77 p 8

[Article: "Asbestos Falsely Labeled"]

[Text] Falsely labeled asbestos has been found at several Swedish construction sites. The most recent alarm came on Tuesday from a site in Vanersborg. The Federation of Construction Workers will now undertake a nation-wide investigation to determine how often asbestos appears under a false label.

The federation has also strongly criticised the labor protection administration for being overly generous in the matter of dispensations from regulations during what is referred to as a "period of transition." Following a number of investigations concerning the cancer risk, asbestos is subject to a number of safety regulations. About 5,000 tons of raw asbestos is still imported each year.

On Tuesday, eight men who were doing insulation work with asbestos on a house in Vanersborg were ordered to quit work by Ombudsman Per-Olof Blixt of the Federation of Construction Workers. Blixt was on a routine visit to the project when he found asbestos, which, however, had a different label. The Federation of Construction Workers will undertake a nation-wide investigation to determine how often asbestos appears under a different name.

After New Year's, asbestos is to be entirely eliminated, but working with dusty asbestos is already prohibited.

"The construction firm at first admitted that the material was asbestos, but claimed to have obtained dispensation from the labor protection administration. A check on this proved it to be untrue, however," says Blixt.

The firm then changed its tune and said it was not asbestos but a different insulation material. This also proved to be untrue.

The asbestos material in question was imported under a false label. Importers and wholesalers in the industry are behind it, according to Blixt.



"I found the material, which is used for insulation at very high temperatures, and saw at once that it was ordinary asbestos cloth; large rolls of a material called Fortex. It consists of pure asbestos, however. "We have found this material in several other places. We also suspect, however, that asbestos also appears under other disguising labels. "I contacted the labor protection administration, which confirmed that it has been ascertained that the material in question is falsely labeled asbestos. I don't know why the labor protection administration has not itself issued a warning to protect firms and workers."

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SWEDEN

METAL WORKERS ASK FOR TOUGHER ENVIRONMENTAL SAFETY LAW

Stockholm DAGENS NYHETER in Swedish 24 Aug 77 p 8

[Article by Brigitta Albons: "Stricker Environmental Requirements" ]

[Text] -- We must introduce negative demonstration of proof so that machinery and materials shall be proved harmless before they are introduced to the labor market.

-- The highest limits on dangerous substances must be the law, not merely recommendations as they are now.

--We need a professional work environment institute, with its own researchers, physicians, and other experts.

These are three important labor environment demands proposed to the congress of the Federation of Metal Workers, to be held in the middle of September.

Today, the workers themselves and the researchers are in most cases forced to prove that a substance is dangerous before it is banned or the risk is eliminated through safer handling. In addition, such determinations are of such nature that extraordinarily strict proof is most often required.

This means that many people must risk their lives or at least their health during the long period of time needed for "adequate" proof to be obtained.

This is a question which those who present the demands tie in with research. Much of the research is carried on by industry, and the labor unions must therefore establish their own [research] organization. "Research fully at the service of the working class must be oriented toward its interests and be based entirely upon the assessments of the working class," those making the motions assert.

They do not regard the Center for Labor Questions recently established by parliament as adequate because it is a research organ composed of one party to the problem.

They point out that Gunnar Nilsson, chairman of the LO National Federation of Trade Unions, said after the 1976 LO congress that research on labor problems would be the great question at the next congress. He also said: "Whoever controls research controls the future."

Those who present these motions also renew the demand that trade union representatives and their experts must have free access to all places of work.

These demands are presented in 10 similarly worded motions in a total of 43 motions dealing with questions of the environment.

The board of the Federation of Metal Workers stands behind all of the demands, except those calling for a union labor environment institute. The board points out that it does not wish [research] resources to be split up, wishing instead to work for greater influence upon research already available. In addition, it refers to the LO analysis at the present time in the process of establishing a union research policy.

Several months stress that protection ombudsmen at the places of work should have more and better training, and many point out the importance of training opportunities being created in labor environment questions in both universities and at the high school level.

Another important demand is considerably increased resources for labor conditions inspections, labor protection management, and clinics for labor medicine in the country.

Local 288, Blomstermala, demands that more severe measures be taken against employers who violate provisions of the law, but are prosecuted only in exceptional cases.

Employers may be guilty of neglect leading to fatal accidents without being prosecuted.

"Negligence which in all other circumstances would be judged according to the criminal code when engaged in by enterprise managements, usually result in no action taken at all. Serious violations of the labor protection law should be dealt with as is other criminality," the local writes.

The local therefore is of the opinion that the police, prosecutors, and judges should have training so that they would know how accidents on the job and occupational disease should be dealt with.

"The purpose of this motion is not that of filling prisons with a new clientele, such as general managers and other enterprise leaders. But it must at last be made clear that the employer who causes the death of another person, his injury or illness through negligence, must reckon with prosecution under the law," writes the Blomstermala local.

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END